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# APPLICATION OF LOCALLY GROWN BANANA LEAVES FOR WOUND DRESSING IN TANZANIA*

**Key words:** wound dressing, biomaterial, banana leaves, biological properties, phytochemicals.

Few reports exist on the use of banana leaves as wound dressing biomaterial [1, 2]. The current study assessed biological properties and safety profile of extracts from locally grown banana leaves in Arusha (Tanzania), to affirm their possible use for wound dressing.

Preliminary screening for phytochemicals in extracts from studied banana plant species, ijuhi inkundu (IJ) mlelembo (ML) and kimalindi (KIM), revealed presence of various secondary metabolites viz. anthraquinones, alkaloids, flavonoids, tannins, terpenoids, phenols, phytosterol and saponins. These phytoconstituents are known to have medicinal values.

Antimicrobial activities of three banana varieties were tested against six pathogenic microorganisms. Susceptibility of microorganisms to studied banana varieties were in the order of KIM > ML > IJ, with average MIC of 1.51 ± 0.17, 4.65 ± 1.25, 6.27 ± 2.36 mg/ mL respectively, with *kimalindi* being more effective than the rest of studied plants ($p < 0.05$). This finding suggests that *kimalindi* leaves present the best option when used to dress wounds, as it has better antimicrobial property compared to other two studied leaf extracts.

One-way analysis of variance (ANOVA) revealed a statistical difference of mean among all extracts ($p < 0.05$), whereby the effectiveness of plant extracts against tested microorganisms were in the order of KIM> IJ> ML, suggesting that *kimalindi* extracts had better effect against the tested microorganisms, hence presenting the best option when used in wound dressing.

Moreover, results also revealed that, all tested organisms were susceptible to the studied banana extracts; however, their susceptibility was in the order of *C. albicans* > *C. neoformans* > *S. aureus* > *S. typhi* >*E. coli* > *P. aeruginosa.* These results suggest

that the studied leaves, especially *kimalindi*, may be used in dressing of wounds involving fungal infections (*C. albicans* and *C. neoformans)* and also *S. aureus*, all of which are common wound infections. Antioxidant activity was evaluated by measuring the ability of extracts from *kimalindi*, *mlelembo* and *ijuhi inkundu* to scavenge 2,2-Diphenyl-1-picrylhydrazyl (DPPH) free radical. Results revealed that the scavenging of methanolic DPPH solution was in the order of ascorbic acid >*kimalindi*> *ijuhi inkundu*> *mlelembo,* these results also affirming that *kimalindi* extract had better scavenging of DPPH solution, and hence presents better antioxidant activity, compared to the other two leaves extracts *(ijuhi inkundu* and *mlelembo).*

In conclusion, the herein studied biological properties and safety profile of extracts from locally grown banana leaves *(ijuhi inkundu*, *mlelembo* and *kimalindi)* affirmed their possible use for wound dressing. Findings from this study also suggest that, *kimalindi* leaves present better option when choosing which banana leaves among the three is to be used for wound dressing, based on results from antimicrobial, anti-oxidant and toxicity studies. Finally, this alternative wound dressing biomaterial need to be tested in a controlled clinical trial and compared with modern wound dressing material, in order to get them licensed as medical devices.

**References**


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## EFFECT OF BIOCHAR ON THE GROWTH OF *RICINUS COMMUNIS* GROWN ON COPPER SMELTER WASTE: A POT SCALE STUDY*


**Keywords:** heavy metals, *Ricinus communis*, biochar, accumulation, biomass.